

About *Andricus polycera* (Giraud, 1859) and related forms, with special remarks on *Andricus polycera* and *A. subterranea*

(Insecta, Hymenoptera, Cynipidae)

David Bellido & Juli Pujade-Villar

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In this paper the status of the *polycera* group of species is studied. Two new synonyms are established: *A. polycera* (= *A. polycera transversa*, syn. nov.) and *A. subterranea* (= *A. trinacrae*, syn. nov.) and new characters and problems for the separation of the two species are commented. *A. marchali* is considered as a probable valid species with uncertain status. Reasons leading to these conclusions are commented. Finally, *A. polycera* is definitively removed from the Iberian gall wasp fauna.

David Bellido, Juli Pujade-Villar, Universitat de Barcelona. Facultat de Biologia. Dept. Biologia Animal (Artròpodes), Avda. Diagonal, 645. E-08028-Barcelona. e-mail address: pujade@porthos.bio.ub.es

Introduction

Andricus polycera and *A. subterranea* were originally described as two closely related species of the genus *Cynips* by Giraud (1859). Mayr (1870) examined Giraud's material and considered *Cynips subterranea* as a mere variety of *C. polycera* which was followed by posterior authors (Kieffer 1897-1901, Houard 1908, Dalla Torre & Kieffer 1910, Ionescu 1957, Ambrus 1974, Vassileva-Samnalieva 1983). According to these authors the two forms could be separated by chromatic differences and gall morphology.

Material and methods

Type series of *A. polycera* and *A. subterranea*, from the Giraud's collections deposited in MNHN, Paris were studied and lectotypes established. All descriptions of these forms in the literature have been revised and the Vilarrúbia collection, deposited in the Zoological Museum of Barcelona, was studied. SEM pictures have been made without coating and at low voltage to prevent any risk for the specimens.

Results and discussion

Adults of both forms present a high morphological similarity, although *A. subterranea* individuals are normally darker, especially in their antenna and tibiae. Colour in cynipids is highly variable, so it is not rare to find black forms within a normally brown species (Bellido, Melika & Pujade-Villar, in prep.). Moreover, some cynipids also change their colour depending on the host where they have been reared from (Pujade-Villar et al, in press) and even from different organs of the same host plant (Pujade-Villar 1991).

Tavares (1931) again raised *A. subterranea* to species rank and gave additional characters to separate it from *A. polycera*: antennal segment lengths different in both species, tarsal claws of *A. subterranea* with a longer basal lobe, differences in pubescence of lateral part of the mesosoma and also in median mesoscutal impression. However, none of these characteristics are sufficient for the separation of the two forms, and no clear differences are evident following Tavares' characters. In the same paper Tavares recorded this species from Spain through material collected by Vilarrúbia, in Balenyà (Barcelona, NE Spain), and this species is also recorded in Vilarúbia (1930). However, these records do not belong to *A. polycera*, as Nieves-Aldrey (1987) suggested. *Andricus polycerus* pictures in Tavares' paper belong to an *A. kollari* gall with protuberances, and two galls found at Vilarrúbia's collection in the Zoological Museum of Barcelona are *A. quercustozae* galls probably deformed by a parasitoid attack in their first developmental stages. In north-eastern Iberian Peninsula we have repeatedly observed similar galls, normally in oaks highly attacked by *A. quercustozae*. Therefore this species is definitively excluded from the Iberian gall wasp fauna list.

Galls of *A. polycera* and *A. subterranea* are also very similar, although they normally are considered to be different. *A. polycera* galls are found in aerial buds of *Quercus petraea*, *Q. robur* and *Q. humilis*, preferentially on younger, shrub-sized trees (Csóka 1997), while *A. subterranea* is found on subterranean stems or rhizomae of the same oaks, normally hidden by a thin layer of litter above them. Moreover, *A. subterranea* galls are shorter, softer, more irregular and without long protuberances in their apex. Records of *A. subterranea* in Ionescu (1957) and Ambrus (1974) are interesting, since galls in the pictures seem to have appendices in their superior part, like in *A. polycera*, while in typical galls of *A. subterranea* these extensions are not present. Some differences between these two galls could be attributed to their position. Subterranean galls find moister conditions which probably made them softer, and perhaps the other differences, like the absence of protuberances or the smaller height, could also be explained by developmental constraints of their subterranean habitat. On the other hand, height and length of apical expansions of *A. polycera* galls are variable, and subterranean galls may only represent an extreme of this variation.

Other species of cynipids can be found at subterranean and aerial organs, although these misplacements occur more or less frequently, depending on the species. This duality in location has been observed in *Trigonaspis megaptera*, *Andricus sieboldi* (ag. gen.) and *Plagiotrochus kiefferianus* (ag. gen.) (Pujade-Villar, pers. obs.). There is also a slight difference of emergence between *A. polycera* and *A. subterranea*: while the first appears from end of October to beginning of November, *A. subterranea* is seen in middle of November (Giraud 1859). This variance can be explained by habitat differences and has been observed in *Plagiotrochus kiefferianus* (Pujade-Villar, unpublished data).

From all these observations it would seem that these two species are identical, and the galls then would represent only extremes of variation. However, studies of adults also shows some morphological differences and so they do not support this hypothesis, as will be discussed below.

After examination of the type series of both species deposited in the Giraud's collection from MNHN, Paris, we have concluded that these two species are very similar morphologically, but we have found some differences in propodeum pubescence: In *A. polycera* the propodeal area (Fig. 1a) is only slightly pubescent and normally limited to the superior corners while in *A. subterranea* the propodeum (Fig. 1b) normally is densely pubescent and occupies the whole propodeum, reaching always the nucha. This character is less obvious in some adults but always both forms can be separated. In the type series of *A. polycera* there is also a perceptible chromatic variation, including some darker individuals which are relatively similar to typical *A. subterranea* adults, but all studied *A. subterranea* adults are darker, and although this chromatic aspect is not useful alone, it could be helpful in the separation of the two forms. Further studies could demonstrate that all variability falls inside the intraspecific rank, but considering the small differences between other species of cynipids (i.e. in the *A. kollari* group), we think it better to maintain the specific status of both forms.

Three other varieties of *A. polycera* are known: *A. polycera transversa* Kieffer, *A. polycera trinacriae* Stefani and *A. polycera marchali* Kieffer. Unfortunately, the Stefani collection was lost during 2nd World War (Horn et al. 1990) and the Kieffer collection is very dispersed and the location of many types is unknown, or they were lost by different reasons, because Kieffer used to return the material to the collectors. The current status of Kieffer's taxa should be considered as doubtful, since they can represent valid species or forms or not. Tavares (1931) treated *A. polycera transversa* and *A. polycera trinacriae* as a subspecies of *A. polycera*; he also recorded the high similarity of *A. polycera trinacriae* galls with those of *A. subterranea* (according to Mayr), and that there were no differences between these

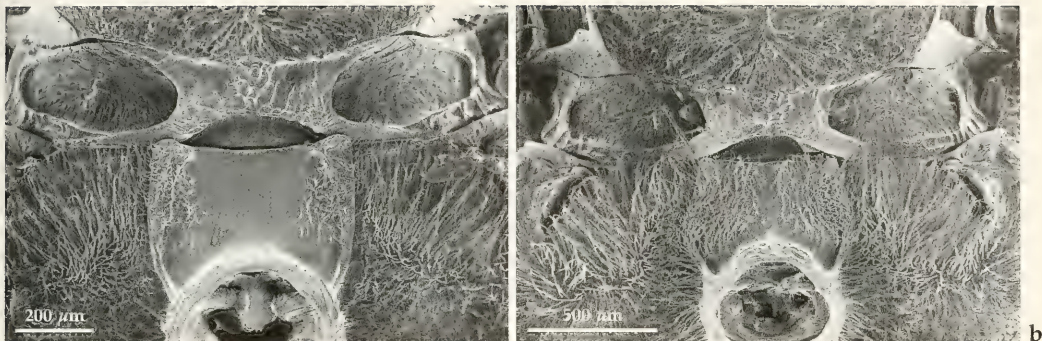


Fig. 1. Propodeal area of *Andricus polycera* (a) and *A. subterranea* (b).

forms and the typical one. Therefore, *A. polycera trinacriae* is probably a synonym of *A. subterranea* and *A. polycera transversa* is probably a synonymic name of *A. polycera*, given the high variability of galls of these species. Finally, Tavares considered *A. polycera marchali* as a different species because of differences in mesoscutum sculpture, relative length of antenna and hypopygial spine, among others. In this case, again type material is not available, because the location of Kieffer's types is unknown, and the Tavares collection was destroyed during a fire which affected great parts of Lisboa in the last century. However, according to his paper, the material examined was sent by Marchal, who collected the gall described by Kieffer, and which came from the same zone. Therefore, we consider that it actually represents a different species, especially in view of its gall morphology, and that it is rather remotely related to other forms of *A. polycera*. In this case Tavares' characters could be used for the separation of this species.

Conclusions

- *Cynips polycera* Giraud, 1859. Lectotype: agamic ♀, (deposited in MNHN), here designated (examined). "Museum Paris 4- C. polycera Aust. G. Coll. Giraud" (white label); "Cynips polycera, typical series" (white label); "Lectotype" (red label); "Andricus polycera (Giraud), Bellido & Pujade-Villar det.-1999" (white label). Paralectotypes: 39 agamic ♀♀, 4 galls. Same data of lectotype, emergence dates: 25th March (1♀, extracted from the gall), 20th June (3♀♀), 18th August (12 specimens), 28th August (12♀♀), no additional data (11♀♀, one of them with a white label "4 Cynips polycera G. Aust. G"); material deposited in MNHN except 5 adults in Barcelona University.
- *Cynips polycera* var. *transversa* Kieffer, 1897. Syn. nov. of *A. polycera* (not examined).
- *Cynips subterranea* Giraud, 1859. Lectotype: agamic ♀, (deposited in MNHN), here designated (examined). "5 Cynips subterranea G. aust. G" (white label), "Museum Paris, Coll. Giraud" (white label), "Cynips subterranea, typical series" (white label), "Lectotype" (red label), "Andricus subterranea (Giraud), Bellido & Pujade-Villar det.-1999" (white label). Paralectotypes: 22 agamic ♀♀, 2 galls. Same data of lectotype but without the first label; emergence dates: 12th September (8 specimens), 15th September (2 specimens), 20th September (6 specimens), 4th November (6 specimens), material deposited in MNHN except 3 adults in Barcelona University.
- *Cynips trinacriae* Stefani, 1906. Syn. nov. of *A. subterranea* (not examined).
- *Cynips polycera* var. *marchali* Kieffer, 1897. Incertae sedis. Probably a valid species, *A. marchali* (Kieffer, 1897)

Key to the valid species of the *A. polycera*-group

1. Propodeal area normally only slightly pubescent, and hairs restricted to its superior part, never reaching nucha (Fig. 1a). Colour variable, but normally brown. Galls in aerial buds of deciduous oaks, variable in height and in length of apical protuberances. *A. polycera* Giraud

- Propodeal area normally strongly pubescent and hairs reaching nucha (Fig. 1b), adults normally darker, especially in their antenna and tibiae. Subterranean galls shorter, softer, more irregular and without apical expansions. *A. subterranea* Giraud

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